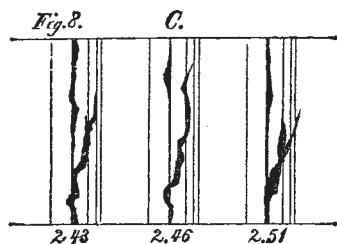


of the equatorial was stopped, the luminous cloud took 16.7 seconds of time to traverse the slit which was placed parallel to the hour-circle. This indicates a length of at least 130,000 miles without allowing anything for the foreshortening resulting from the nearness of the sun's limb.



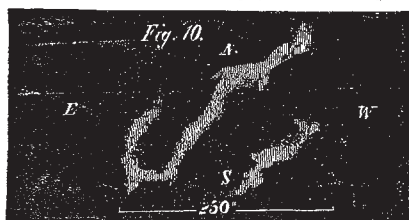
By five o'clock the clouds had nearly disappeared; a little rack alone remained.

At 4.20 I examined the spot with the equatorial, using the ordinary solar eye-piece. Nothing remarkable was to be seen—not the merest trace of the enormous masses of incandescent gas.



It will be interesting to learn whether the earth responded to this magnificent eruption on the sun by any magnetic storm.

I may add that in the telescope this group of spots, from their first appearance, exhibited a strong yellowish tinge, which ap-



peared to overlie all the central portion of the cluster. So conspicuous was it that several persons, unaccustomed to astronomical observation, noticed it at once before I called their attention to it. The penumbra of the group was unusually faint.

Hanover, N.H., October 3

C. A. YOUNG

NOTES

THE first detachment of the Eclipse Expedition for Spain and Algiers started from Portsmouth in H.M.S. *Urgent* on Tuesday morning; the Sicilian party followed overland yesterday evening. An error crept into the names of the party in our list published last week. Professor Roscoe's assistant is Mr. Edward Ernest Bowen, M.A., late Fellow of Trinity College, Cambridge.

AT one of the most recent sittings of the French Institute a communication was made by M. Faye on the intended departure of M. Janssen to join the Eclipse Expedition. This celebrated astronomer was to leave Paris in a balloon constructed for his private use at the expense of the French Government, and which will also carry a telescope, constructed in eight weeks by the most skilful workmen in Paris, and of the capacity of 2,000 cubic metres. It will be fitted up with a new kind of valve, invented by M. de Fonvielle, and which was not quite ready

when that gentleman left Paris. According to every probability M. Janssen will ascend with M. Tournier, one of the passengers in the "Pole Nord," but taking the management of the balloon under his own care. The telescope was put in hand a very few days after the 4th of September. The Government appeared so anxious to show the interest taken in the matter that they did not lose a single day after they came into power in fitting up this expedition. The expenses of the construction of the telescope were incurred by the Bureau des Longitudes.

THE French *Académie des Sciences* has held its sittings regularly since the commencement of the siege, and the *Comptes rendus* has been published regularly every week. Every sitting is reported fully, and several numbers have had even more than the average number of pages. A large part of them is devoted to military science and to ballooning. The scheme put forward by M. Dupuy de l'Ôme was fully discussed and illustrated by copper-plates: an article contributed to the *Presses*, by Mr. Giffard, the celebrated engineer, when reporting upon his aerial experiments as much as twenty years ago, has been reprinted. It was shown that Dupuy de l'Ôme's experiment was almost of the same nature, and the *Académie des Sciences* has apologised for not publishing it in proper time. M. Dumas and M. Elie de Beaumont, although members of the former senate, now act in their capacity of *secrétaires perpétuels* of the Academy. M. Leverrier has not appeared at any of the sittings. M. Chasles is most punctual in his attendance. Lectures are given at the *Conservatoire des Arts et Métiers*, and are to be given at the *Collège de France*. No lectures have been given this session at the *Sorbonne*. Since the commencement of the siege, a few numbers only have been issued of the *Revue des Cours Scientifiques*; *Les Mondes* and *Cosmos* have been entirely suspended.

A LARGE number of the animals at the *Jardin des Plantes* and *Jardin d'Acclimation* have been sold and slaughtered for food, even the bears having now been sacrificed. The trees in the latter garden have been almost entirely cut down either for charcoal or for the necessities of the defence.

WE are very glad to be able to report that Sir Roderick Murchison has gained strength during the past week, though his state still continues critical. Prof. Balfour Stewart will have to remain at Harrow for at least some weeks, but is progressing as satisfactorily as possible, considering the nature of his injuries.

THE ratepayers of Marylebone have done good service to Science in electing Miss Garrett, M.D., and Prof. Huxley to the London School Board, first and second on the poll, the former by a triumphant majority over every other candidate. If their example is generally followed throughout the country, we may anticipate great things in the future for the scientific education of the country.

OWING to Professor Tyndall's absence with the Eclipse Expedition, the first conversazione at the London Institution, announced for Dec. 21st, is postponed till Jan. 25th, when he will deliver his lecture on Dust and Disease.

WE regret to learn that the North London Naturalists' Society terminated its existence on Monday, Nov. 27. It has been established for about six years, and was for some time carried on with spirit; but the interest in it has for some time been on the decline, and it was considered advisable to bring it to a close. We understand that it is in contemplation to form another society in its place, which only actual workers will be invited to join. When we consider how many useful bodies of this description are scattered throughout the country, it seems strange that a similar one cannot be kept afloat in London; but the fate of the North London Club, preceded as it was by the collapse of the Society of Amateur Botanists, and of the West End Naturalists'

Society, is somewhat discouraging, and a well-supported body of workers in all branches of Natural Science seems likely to be a desideratum.

PROF. HASSKARL reports that the cultivation of *Cinchona* in Java is proceeding satisfactorily. The weather, on the whole, has been favourable, and the growth of the plants leaves nothing to be desired. The number of plants grown from seeds and layers is upwards of one and a half millions, by far the greater number belonging to the species *C. calisaya*, a good many to *C. officinalis* and *succirubra*, and a very few to *C. lancifolia* and *micrantha*. In addition to these, 870,000 plants have been transplanted, and the whole shows an increase of nearly 200,000 plants since the commencement of the year. 460 kilogrammes of the dry bark were sent to Holland in December, 1869, and sold at from two to three florins per kil.; 900 kilogrammes have since been exported, and more than 1,000 were ready at the date of the despatch. Prof. Hasskarl reckons the total produce of 1870 at no less than 4,000 kilogrammes of dry bark for exportation, besides some hundreds for home use in the island. An important branch of industry in the colony is now formed by the stripping, cutting, drying, sorting, and packing of the *Cinchona*.

THE report of the Hartley Institution, Southampton, for the current year gives a very favourable account of its position and prospects. The students in the day classes have increased from twenty-nine last year to eighty-six; in the evening classes there have been thirty-one. Among the students of the engineering department there have been as many as eighteen government nominees to the Telegraphic Service of India, who have been pursuing an advanced course of instruction in mathematics and physical science to qualify them for their final examination. A class of fourteen nominees has also been under instruction in the Institution during the year in practical telegraphy. At the last final examination for appointments to the Indian Telegraphic Service, all the successful candidates, except one, had been instructed in the Institution. There is a library of 400 or 500 volumes in connection with the Institution, a reading-room amply supplied with the current literary, scientific, and political publications of the day, and a good course of lectures was delivered during last session.

A WRITER in the *Boston Post* of October 24 thus describes the present condition of the Museum of Comparative Zoology in that city:—Since the acquisition of the private collection of Prof. Agassiz, the Boston Museum may claim to rank among the foremost institutions of its kind; for although the British Museum in London and the Jardin des Plantes in Paris are on a very much larger scale, yet in certain departments, such as corals and fishes, the Museum of Comparative Zoology is superior to both, while the increase of its collections since its existence, and the prominence it has attained among other museums, are such as no like establishment has reached in the same time and with the same means. From want of room the greater part of the Museum as it now exists is occupied by working-rooms and store-rooms, and only four rooms are devoted to exhibition. Each of these contains the representatives of one great division of the animal kingdom, and it is intended to complete them in such a manner that they shall exhibit in an easy and conspicuous way the natural relations of all the animals known in creation. In the new building now going up, which adjoins the present Museum and is to be of equal dimensions, it is intended to exhibit all the animals peculiar to the different parts of the world, in such a manner as to impress the observer with their natural association in nature, so that the student of Natural History shall be able to make himself familiar in one part of the building with the latest result of scientific research in working out the system which binds

together the whole animal kingdom as a unit; while in the other part of the building their geographical distribution upon the whole surface of the earth, and their various combinations and associations on different continents will be made apparent. Such a twofold arrangement of collections has never yet been attempted in any museum, not even in the largest and most prominent institutions of the kind in Europe. The fossil remains of past ages will be exhibited in like manner in such an arrangement as to display at the same time their order of succession in geological periods, and their relations to the animals now living. It is intended to complete this plan by exhibiting also the different stages of all known animals, from their earliest period of development in the egg to their adult condition. This is a truly magnificent plan, but although the addition to the Museum will double the amount of room, yet the whole of this plan cannot be carried out at present, and a large part of the collections must still remain in the store-rooms until another section of the building can be completed. It is sincerely to be hoped that the strong interest which has already been shown by the Legislature of Massachusetts and the citizens of Boston will not flag, and that sufficient aid will be given to carry out and fully complete this admirable work, within the lifetime of the distinguished man who has done so much to elevate the tone of thought, and improve the method of education in this his adopted country.—We imagine it must be only typical animals of each group that are referred to in the above account. It is to the munificence of a private patron of this Museum, Mr. Nathaniel Thayer, that Science is indebted for Prof. Agassiz's recent exploration of Brazil, with six trained assistants.

A SECOND paper on "Mystic Trees and Flowers" appears in *Fraser's Magazine* for this month. Herbaceous plants form the subject of this portion, the mandrake (of the history of which an especially interesting sketch is given), mistletoe, rose, lily, violet, and primrose, being the principal which are touched upon in detail. The author, Mr. Moncure D. Conway, in some concluding remarks, states his belief that "the reverence paid to trees and flowers" must be looked upon "not as fetish worship, but as a sacred regard paid to them as oracles of beings higher than themselves," and combats the idea "that it was from these lower objects that reverence gradually ascended to the adoration of the sun and stars, as the case was really the reverse."

THE *British Medical Journal* quotes the following description of "The Nemesis of Tobacco," from the ninetieth observation of Theodorus Kerckringius, M.D. (*Spicilegium Anatomicum*, Amsterdam, circa 1670) describing the *post mortem* appearances of an inveterate smoker:—"Too greatly, now, alas! in Europe, prevails, that *cacoëthes* of sucking up the smoke of the herb tobacco, as they call it, through tubes actually manufactured for that special purpose! In consequence, what a perversity of morals has arisen they must have noted whose duty it is to attend to the public morality, whether they be politicians or theologians. How noxious it is to the health of those who indulge in the habit of sacrificing so often to Vulcan, or rather to Charon, I shall not here explain. Let it suffice, that I adduce the case of a man whose body I opened before the Faculty. He, ordinarly given to these fuliginous delights, had scarcely ever engaged in any kind of work, as it appeared, without inhaling this fatal juice. When, however, at length, Nature, assailed by frequent attacks, began to fail, and to give way to disease, he rejected for so long a time a black-looking matter, both upwards and downwards (*per utrumque gutturem*) that at last he vomited forth his dusky soul; which to accompany in its visit to the realms of Pluto would be far from agreeable, for, I suspect, it would greatly, and that from habit, have preferred those black lakes, steaming with the bubbles of Stygian vapours, to the lucid stars of heaven, inasmuch as it had long been fed, though not

nourished, by smoke; the abode, however, it had relinquished, I visited and examined by the aid of the scalpel of the anatomist. What did I observe, you ask? It appeared to me that I was passing into the very house of Pluto himself; even the entrance-doors were tinged of a black colour, and the tongue, imbued, as it were, with the poisonous juice, was in a state of tumefaction. What as to the windpipe? It was like the inside of a chimney, coated completely with black grime. The lungs were dry, sapless, and scarcely at all friable. The liver, as if it, beyond all the other organs, had attracted the fire, was altogether inflamed; from the flames of this fire not even the bile in its receptacle had been safe, for its colour had changed from purple to green (*ex purpureo virescentem*). In the intestines, however, the drains of the body, the carbonaceous matters from the whole combustion had become concentrated, for they were full of a black substance which exhaled no milder stench than that of Hell itself. Such, of this frequent suction, are the medicinal fruits!"

AT the meeting of the Geologists' Association, on Friday evening last, Mr. R. Etheridge read a paper on "The British Islands Past and Present, Physically considered." After making some remarks on the intense interest and importance of the subject, he proceeded to describe the distribution of land and water at different geological epochs, and to show that England, Ireland, and the Continent, were once united, and that the many and great changes which have taken place have arisen from the elevation or depression of the land, not from alteration of the sea level. Mr. Etheridge then referred to the changes which have taken place in the relative positions of land and water during the historic period, giving instances of towns and cities that in the time of their prosperity stood some distance from the sea, but have been gradually submerged, and other places, whose importance arose from their contiguity to the ocean, now left high and dry inland. The paper was illustrated by a splendid collection of diagrams.

THE Seventh Annual Report of the Belfast Naturalists' Club shows that this useful Society is making good progress. By the kindness of the Council of the Natural History Society, members of the Club have been permitted to re-arrange the valuable local collections in the Museum; and a large sum has been granted by the Council for cases, &c., in which to exhibit a complete local collection. The local land, freshwater, and marine shells have been named and arranged; the Herbarium is in progress; and the Geological collection selected and named, ready for mounting. The Committee have also considered it desirable that the Club should prepare complete lists of the fauna, flora, geology, and archaeology of Ulster, by publishing an annual contribution to such a work in addition to the ordinary report. The Appendix in the present issue consists of a list of the Irish Liassic Fossils, with notes on new and critical species, by Ralph Tate, Esq., F.G.S. The number of species enumerated is 189; of which the following are new to science:—*Chemnitzia punctata*, *Solarium thompsoni*, *Tornatella robinsoni*, *Pleurotomaria tectaria*, *Hinnites angularis*, *Avicula pattersoni*, *Leda v-scripta*, *L. quenstedti*, *Cucullea graingeri*, *Mytilus subtilis*, *Thracia æquata*, *Anatina myacina*, *Pollicipes alatus*. Figures of many of these are given in an accompanying plate, and the paper is a valuable contribution to local geology. We congratulate the Belfast Club on having successfully started a work which will give a permanent value to their annual reports, and trust that their example will be widely followed by other local societies.

In the Chittagong district the Government of India has discontinued explorations for coal at present, as the samples found are of an inferior and unpromising quality.

BALLOON ASCENTS FOR MILITARY PURPOSES

AS soon as the war broke out, balloons, which had been so long forgotten by statesmen, were recalled to their memory by hundreds of projectors. Some of the schemes suggested were of the wildest description; and scientific men took advantage of this circumstance to reject everything connected with aeronautics. But surprises and reverses became so frequent in the French army, that it became evident that any apparatus able to carry observers would be considered as a preserver from such disgraces. As soon as it was clear that the Prussians were intending to besiege Paris, the Minister of War issued orders for the construction of a captive balloon, intended to watch the movements of any besieging army moving round the capital; but instead of having recourse to Mr. Giffard, the constructor of so many magnificent balloons, it was resolved to employ MM. Godard and Nadar. Paris was divided into aerial districts, the first being given to Nadar and the other to Godard. Nadar then received orders to establish his balloon on the foot of Buttes Montmartre, and Godard close to the Montsouris Meteorological Observatory on the banks of the small streamlet Bièvre, where it crosses the fortifications. The balloons intended to be attached were not made on purpose, they merely used old ones which were worn out; the gas-pipes were also not sufficiently large, and the gas-pressure was very low, so that when the first attempts at inflating were made, the Godard balloon took more than three days to be filled; and, when filled, was tossed so heavily by the wind, that it was necessary to let the gas escape. Nadar was still more unfortunate, and could not arrive even at the inflating of his balloon, except after immense labour, by laying a pipe along the ground for a space of more than 300 yards. Moreover, when the first balloon was floated, it was as late as the 4th of September. I then ordered Godard to continue his inflating process. Many scientific bodies met, and deliberated upon the modes of improving captive balloon ascents; but none of the members had ever ascended, and hence their practical knowledge was so small as to amount practically to nothing.

I tried to improve in some respects the construction of captive balloons, by using the process of fixing to the rope invented and practised by the aeronauts of the First Republic, and offered to the State a balloon, which had been given to me by my friend, Mr. Giffard, and which had, unfortunately, only a capacity of 28,000 cubic feet. I had already used this balloon for an ascent, executed for the benefit of the *Arène de la Rue Monge*.

That balloon was fitted up in a more scientific manner, the appendix being also firmly attached with rope, so that the pressure of the wind could not let a single puff of gas escape. The equatorial ropes were attached together and connected by means of little pulleys, the pulleys being connected by ropes, and so on till the whole of the network ended in three large ropes. This machinery worked admirably well, but the material of the balloon was not fit for the purpose. After two or three weeks' standing, the company was dissolved, and the balloon was sent free into the air. Captive observations were not so useful as had been hoped; that partial failure was owing to the unfitness of officers entrusted with the duty of making observations, and of the men employed in the drawing of the ropes. Nothing of the kind would have happened if Government had accepted the offers made by Mr. Giffard before the beginning of the war. That great engineer had offered to spend 40,000*l.* in the construction of a large balloon of 15,000 cubic metres capacity, able to carry 40 persons to the height of a full kilometre, but the Government had refused this proposal because Mr. Giffard asked for a place in the Champs Elysées, where it would have been necessary to displace a few shrubs.

When the investment of Paris was completed, the question naturally arose of using balloons for carrying messages, the resolution having been taken by the minister, M. Rampont, Post-office Director, to summon to his office several aeronauts, Nadar, Artoise, myself, and a few gentlemen supposed to be acquainted with aerostatics; and the ascent was decided upon in a long discussion.

The first who ascended, was Durioff with his own balloon, famous from several ascents. Durioff started up into the air early in the morning, and employed an immense lifting power, the wind blowing strongly besides, and Durioff disappeared like a dream. He was alone in his car, carrying a bag of letters, with plenty of ballast; I protested in the most urgent manner against sending into the air a single man unassisted, but without any success. The advice was neglected in consequence of the success of the